by-side to form a 80-mm-high single magnetic core. The primary and secondary coils were wound identically to the core-coil assembly of Example 1. The secondary voltage versus primary current obtained is set forth below in Table II:

TABLE II

Primary Current (amp-turn)	Secondary Voltage (k V)
40	4.2
80	8.4
160	14.2
240	18.5
320	21.6
400	23.1

Secondary voltages exceeding 14 and 23 kV were attained with primary currents of about 160 and 400 amp·turns, respectively.

EXAMPLE 3

Five 15.6 mm high toroidal cores were prepared following the process of Example 1 and were assembled to form a single cylindrical core of about 80 mm in height. The core-coil assembly was substantially identical to that of Example 1, except that the secondary coil had 138 turns. The secondary voltage as a function of the primary current is set forth below in Table III:

TABLE III

Primary Current (amp-turn)	Secondary Voltage (k V)
40	5.4
80	10.2
160	17.8
240	22.4
320	25.6
360	26.1

Secondary voltages exceeding 10 and 26 kV were attained with primary currents of about 80 and 360 amp·turns, respectively.

EXAMPLE 4

An 80 mm high cylindrical core with the dimension given in Example 1 was prepared and heat-treated at 350° C. for 2 hours. After the heat-treatment, an air-gap was introduced along the cylinder axis by cutting-off part of the core. The primary and secondary coils were wound on the metallic section of the core. The rest of the core-coil assembly was substantially identical to that of Example 1. The resultant secondary voltage-versus-primary current is set forth below in Table IV:

TABLE IV

Primary Current (amp-turn)	Secondary Voltage (k V)
40	4.9
80	9.6
120	14.4
160	19.4
260	22.5
240	26.3
260	27.3

Secondary voltages exceeding 14 and 27 kV were obtained with primary currents of about 120 and 260 amp·turns, respectively.

Having thus described the invention in rather full detail, it will be understood that such detail need not be strictly adhered to but that further changes and modifications may suggest themselves to one skilled in the art, all falling within the scope of the invention as defined by the subjoined claims.

What is claimed is:

1. A magnetic core-coil assembly for generating an ignition event in a spark ignition internal combustion system having at least one combustion chamber, comprising a magnetic core that is iron based and further comprises metallic elements including nickel and cobalt, glass forming elements including boron and carbon, and semi-metallic elements, including silicon, said core being fabricated by heat treating an amorphous magnetic alloy and having a primary coil for low voltage excitation and a secondary coil for a high voltage output to be fed to a spark plug, said core-coil assembly having the capability of (i) generating a high voltage in the secondary coil within a short period of time following excitation thereof, and (ii) sensing spark ignition conditions in the combustion chamber to control the ignition event.

2. A magnetic core-coil assembly as recited in claim 1, wherein the magnetic core comprises segmented cores.

3. A magnetic core-coil assembly as recited in claim 1, wherein the output voltage in the secondary coil reaches more than 10 kV with a primary current of less than about 120 amp·turns and more than 20 kV with a primary current of 200 to 300 amp·turns within 25 to 100 μsec.

4. A magnetic core-coil assembly as recited in claim 1, wherein the magnetic core is non-gapped.

5. A magnetic core-coil assembly as recited in claim 1, wherein the magnetic core is gapped.

6. A magnetic core-coil assembly as recited in claim 4, wherein the magnetic core is heat-treated at a temperature near the alloy's crystallization temperature and partially crystallized.

7. A magnetic core-coil assembly as recited in claim 5, wherein the magnetic core is heat-treated below the alloy's crystallization temperature and, upon completion of the heat treatment, remains substantially in an amorphous state.

* * * * *

8. A magnetic core-coil assembly for generating an ignition event in a spark-ignition internal combustion system having at least one combustion chamber, comprising a magnetic core having a primary coil for low voltage excitation and a secondary coil for a high voltage output to be fed to a spark plug, the core comprising amorphous metal, being non-gapped, and having a permeability ranging from about 100 to 300, said core-coil assembly having the capability of (i) generating a high voltage in the secondary coil within a short period of time following excitation thereof, and (ii) sensing spark ignition conditions in the combustion chamber to control the ignition event.

9. A magnetic core-coil assembly as recited in claim 8, said amorphous metal being iron-based.

10. A magnetic core-coil assembly as recited in claim 9, said amorphous metal further comprising boron and silicon.

11. A magnetic core-coil assembly as recited in claim 8, said permeability being achieved by heat-treatment of said amorphous metal.

12. A magnetic core-coil assembly as recited in claim 8, wherein the output voltage in the secondary coil reaches more than 10 kV with a primary current of less than about 120 amp-turns and more than 20 kV with a primary current of 200 to 300 amp-turns within 25 to 100 μsec.

13. A magnetic core-coil assembly for generating an ignition event in a spark-ignition internal combustion system having at least one combustion chamber, comprising a magnetic core having a primary coil for low voltage excitation and a secondary coil for a high voltage output to be fed to a spark plug, the core comprising iron-based amorphous metal heat-treated to have a permeability ranging from about 100 to 300, said core-coil assembly having the capability of (i) generating a high voltage in the secondary coil within a short period of time following excitation thereof, and (ii) sensing spark ignition conditions in the combustion chamber to control the ignition event.

14. A magnetic core-coil assembly as recited in claim 13, said amorphous metal further comprising boron and silicon.

15. A magnetic core-coil assembly for generating an ignition event in a spark-ignition internal combustion system having at least one combustion chamber, comprising a magnetic core having a primary coil for low voltage excitation and a secondary coil for a high voltage output to be fed to a spark plug, the core comprising iron-based amorphous metal and being non-gapped, said core-coil assembly having the capability of (i) generating a high voltage in the secondary coil within a short period of time following excitation thereof, and (ii) sensing spark ignition conditions in the combustion chamber to control the ignition event.

16. A magnetic core-coil assembly as recited in claim 15, said amorphous metal further comprising boron and silicon.

17. A magnetic core-coil assembly for generating an ignition event in a spark-ignition internal combustion system having at least one combustion chamber, comprising a magnetic core having a primary coil for low voltage excitation and a secondary coil for a high voltage output to be fed to a spark plug, the core comprising iron-based amorphous metal and having a permeability ranging from about 100 to 300, said core-coil assembly having the capability of (i) generating a high voltage in the secondary coil within a short period of time following excitation thereof, and (ii) sensing spark ignition conditions in the combustion chamber to control the ignition event.

18. A magnetic core-coil assembly as recited in claim 17, said amorphous metal further comprising boron and silicon.